

STRATEGY
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**PHYSICAL FITNESS IN THE AIR FORCE RESERVE:
PAST, PRESENT, AND FUTURE**

BY

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USAWC STRATEGY RESEARCH PROJECT

**Physical Fitness in the Air Force Reserve: Past,
Present, and Future**

by

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ABSTRACT

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TITLE: Physical Fitness in the Air Force Reserve Past,
Present and Future

FORMAT: Strategy Research Project

DATE: 01 April 1998 PAGES: 58 CLASSIFICATION: Unclassified

In 1994, the U.S. General Accounting Office released a scathing report that portrayed the U.S. Reserve Components as being physically unfit, therefore, not combat ready. Have the Reserve Components reversed this negative trend? Even though improvements have been made, this author feels the Reserves do not take fitness seriously enough. This attitude could seriously degrade the combat effectiveness of our Total Force in the coming millennium.

The focus of this fitness study will be predominantly on the US Air Force Reserve, however data from other reserve components has been used to establish inferences or to allow the reader to postulate. Since the Air Force Reserve fitness program is adapted from the active duty Air Force program, this paper will first address a synopsis of the active Air Force physical fitness program. Included in this recap of Air Force fitness history, is a review of prior research projects written by Air Force officers complete with their respective recommendations.

Interestingly, some of the recommendations made in years' past were eventually adopted, while others have fallen by the wayside. The next section focuses on the state of physical fitness in the Reserve Components. The reader will then find a brief section on what the current Air Force Reserve fitness program entails. Finally, the study will examine what this author feels is the most important challenge of ensuring fitness in the Reserve Component--*how does one motivate a reservist to maintain an adequate level of fitness when they are only in duty status for two days each month?* The recommendations outlined are provided to stimulate critical thinking through surfacing key concepts and ideas that future leaders may need to grapple with.

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PHYSICAL FITNESS IN THE AIR FORCE RESERVE: PAST, PRESENT, AND FUTURE

“As the commander comes to rely on brilliant automated machines to supplement his physical and intellectual abilities, it may appear paradoxical...again...to be told that in some respects he is going to have to be mentally and physically tougher than his predecessors. But such is true ...the brilliant machines never sleep...The senior leader in such operations must possess the physical stamina to stand up to the strain, and he must organize and train his staff to do the same.”¹
—Richard A. Chilcoat, Parameters, Winter 1995-96.

OVERVIEW OF THE AIR FORCE PHYSICAL FITNESS PROGRAM

Since 1972, the Air Force physical fitness program has undergone numerous changes. In February of 1980, the DOD was requested by President Carter to provide an overall assessment of the physical fitness of the US Armed Forces. The following June, an AF symposium addressed the request and came up with a conclusion that pointed to three underlying problems. The symposium concluded that these problems were obstructing the goal of achieving and maintaining a higher level of physical fitness and combat readiness in DOD personnel. The problems identified were: personnel did not understand the relationship between fitness and exercise; testing was not emphasized; and only a limited number of aerobic exercises were used. DOD Directive 1308.1 stated:

Ideally, physical fitness training and activities should be designed to skills needed in combat, enhance cohesion in units, promote competitive spirit, develop positive attitudes towards exercises, and promote self-confidence and discipline. To achieve these ends, physical fitness programs must be careful planned and supervised, follow the established principles of physical training, and involve the participation of all personnel.

Schellhous in 1982, surveyed Air Force personnel and found that individuals on flying status were not in any better physical condition than non-flyers.² Her study compared the mean aerobic points per week between flyers and non-flyers and found no difference in aerobic fitness levels.

Interestingly, Schellhous' study further indicated that if the Cooper aerobic point measurement are used as a basis for physical fitness measurement, only 40 percent of Air Force males are in a passing category and 20 percent of males do not participate in any aerobic exercise whatsoever. Lopez (1986) postulated in his exhaustive study of Air Force fitness, "that aircrew personnel continue to ignore the benefits of physical exercise that would improve their chance of success and survival in a combat environment."

The AF addressed these recommendations and formed a Fitness Advisory Council. In October 1982, an enhanced physical fitness program was developed and briefed to Office of the AF Chief of Staff in early 1983. In 1983, the Air Force Surgeon General strongly recommended that rated flying officers conduct aerobic training that followed Cooper's Category V (excellent) fitness classification. This recommendation included neck exercises and weight training to include arm curls, bent-over rows, bench press, upright rows, lat-machine pull-downs, chin-ups and sit-ups.

In 1983 a two phase enhanced fitness testing program was designed and implemented. During phase one, approximately 2,200 AF members from 22 installations were tested to establish a fitness base line. This test included bodyweight measurements, a 1.5-mile run, and a one-minute sit-up test. No advanced notice of the test was given to participants. Phase two involved over 18,000 personnel at seven locations. All participants received training and prior notification of the test. The test included bodyweight measurements, a 1.5-mile run, and a one-minute sit-up test. The program was scheduled for implementation in 1986, and required an additional 123 manpower slots. The program was submitted for the FY 1987 Program Objective Memorandum (POM) but was cut. The Air Force continued to work on an effective 'enhanced' fitness program that would be safe, feasible and acceptable for command implementation in 1986.

The 1986 AF Physical Fitness program emphasized that fitness standards are an individual responsibility. AFR 35-11, page 4 stated: "The purpose of the Air Force physical fitness program is to encourage individuals to participate in a year-round conditioning program

and to periodically evaluate the fitness level of Air Force members to ensure they are physically prepared to support all military operations, exercises, or other contingencies.”

Since 1986, the Air Force has made considerable changes to its fitness program.

Comparing the 1985 DoD Directive 1308.2 policy with the 1995 DoD Directive 1308.2 policy it is evident that a more specific focus has occurred. The 1985 DoD Physical Fitness policy stated:

Physical fitness is a vital component of combat readiness and is essential to the general well being of armed forces personnel. Individual service members must possess the stamina and strength to perform successfully any potential mission. These qualities, together with weight control, form the basis of the DoD physical fitness program.³

By 1994, the Services had adopted their annual fitness test requirements as outlined in table 1 below.

Table 1: Fitness test components for 1994.

| Assessed Physical Ability | Army | Air Force | Navy | Marines |
|------------------------------|------------|--|---------------------------------------|--|
| Cardio-respiratory Endurance | 2 mile run | 1.5 mile run or 3 mile walk or cycle-ergometry | 1.5 mile run or walk or 500 yard swim | 3 mile run (males) 1.5 mile run (females) |
| Flexibility | Sit-ups | None | Sit-reach | None |
| Upper Body Strength | Pushups | None | Pushups | Pull-ups (males) Flex Arm Hang (females) |
| Lower Body Strength | Sit-ups | None | Curl-ups | Sit-ups |
| Frequency | 6 months | 12 months | 6 months | 6 months |

Note: The Air Force adopted a new fitness test using Cycle Ergometry in 1993. The Air Force Reserve and Air National Guard planned to adopt Cycle Ergometry as their method of fitness testing in 1994. The Air Force had eliminated strength and muscle endurance testing in the early 1980's. In contrast to the 1985 DoD policy previously mentioned, the 1995 DoD Physical Fitness policy stated:

It is the DoD policy that physical fitness is essential to combat readiness and is an important part of the general health and well being for Armed Forces personnel. Individual service members must possess the cardio-respiratory endurance, muscular strength and endurance, and whole body flexibility to successfully perform in accordance with their Service-specific mission and military specialty. Those qualities, as well as balance, agility, and explosive power, together with levels of body composition, form the basis of the DoD Physical Fitness and Body Fat Program.⁴

It is clear from the 1995 DoD directive that emphasis must now be on *aerobic endurance, muscular strength and endurance, and whole body flexibility* versus the older policy of simple *stamina and strength*.

It is clear that the Air Force physical fitness program is changing incrementally over time. It seems the pendulum has swung back again, where now the Air Force is looking to change its testing standards to include muscle strength and endurance. In the 1960's the Air Force had muscle endurance exercises as part of its fitness testing protocols. In October of 1997, the federal Crew System Ergonomics Information Analysis Center conducted a study of the Air Force fitness program and recommended that muscle strength and endurance training be added to the fitness program. Recommended for inclusion were exercises such as sit-ups, leg presses and bench presses. A two-phased plan to incorporate muscle strength and endurance training has been endorsed by the Air Force Surgeon General.⁵ In contrast, the most current AF physical fitness regulation, Air Force Instruction 40-501 (1 October 1998), The Air Force Physical Fitness Program, states:

All members of the Air Force must be physically fit to support the increasing and changing requirements of the Air Force mission. Cardiopulmonary (aerobic) fitness is the single best indicator of total physical fitness. Health benefits from an active lifestyle will increase productivity, maintain a higher level of readiness, and decrease health-related expenditures. The goal of the Air Force Fitness Program is to motivate all members to participate in a year round physical conditioning program emphasizing total fitness to meet mission requirements and deliver a fit and healthy work force and community. Members are given the information needed to develop a physical conditioning programs and are expected to maintain an adequate level of fitness at all times. Each Air Force member is assessed at least once each calendar year to ensure compliance and must meet the fitness standards in Table 3.1. The cycle ergometry assessment was implemented to provide a measure of aerobic capacity or aerobic fitness. The assessment of upper and lower body and abdominal strength and endurance will be accomplished IAW developed guidelines. The results provide commanders with a tool to assist in the determination of the overall fitness of their military personnel.

Further, section 1.2.3. of AFI 40-501 states that, "physical fitness improvement is the responsibility of the entire fitness team--member, Wing Commander or equivalent, unit commander, Fitness Program Manager (FPM), medical, and Services personnel."

According to the Air Force Times, 18 January 1999, exercise physiologist experts at the Aerospace School of Medicine, Brooks AFB, Texas, are setting up testing protocols for new exercises.⁶ These proposed exercises will be tested at eight Air Force bases. Airmen at the test bases will be asked to complete a second exercise after completing their respective annual fitness test. Officials plan to use the scientific test results to incorporate the new exercise protocols into the Air Force fitness program. The Air Force Reserve and Air National Guard will adhere to active Air Force fitness regulations.

In early January 1999 the Services adopted new standards for their annual fitness tests. The changes are reflected in table 2 below.

Table 2: Fitness test components for 1999.

| Assessed physical ability | Army | Air Force | Navy | Marines |
|------------------------------|------------|--------------------------------|---------------------------------------|---|
| Cardio-respiratory Endurance | 2 mile run | Cycle-ergometry or 3-mile walk | 1.5 mile run or 500 yard swim or walk | 3 mile run |
| Flexibility | Sit-ups | None | Sit-reach | None |
| Upper Body Strength | Pushups | None | Pushups | Pull-ups (males) Dead hang (females) |
| Lower Body Strength | Sit-ups | None | Sit-ups | Crunches |
| Frequency | 6 months | 12 months | 6 months | 6 months |

Note: The Marines replaced sit-ups with crunches and all Marines now run 3 miles. The Navy replaced curl-ups with sit-ups.

A REVIEW OF FIVE AIR FORCE PHYSICAL FITNESS STUDIES

In this chapter, five Air Force physical fitness studies written between 1986 and 1991 will be reviewed. This should provide insight into what these authors believed to be problems

with fitness in the Air Force. The authors, most of which were Air Force commanders, provide the reader with candid observations and recommendations. Often they discuss what is or is not being done at the unit level regarding fitness. Particular attention has been paid to recommendations for improving physical fitness programs. In short, all five studies take a negative view of the Air Force Physical Fitness program. All recommendations for improvement focus on requiring more stringent evaluation standards, increasing senior leadership involvement, increase funding for fitness facilities and manning, and finally, to allow for more flexible evaluation methods. Eventually, some recommendations were incrementally incorporated into Air Force directives.

Colonel Gerald J. Lopez: Air Force Physical Fitness and Combat Readiness...Myth or Reality?

The first study reviewed was conducted by Colonel Gerald J. Lopez while a student at Army War College in 1986. Colonel Lopez 's 116 page study entitled, "Air Force Physical Fitness and Combat Readiness--Myth or Reality?" concludes that Air Force physical fitness programs have undergone major changes since the 1960's.⁷ However, these changes "have always diluted the program, and the perception by Air Force personnel has reached a level of general apathy toward Air Force fitness requirements."⁸ Lopez utilized many fitness studies from renowned aerobics and running 'guru,' Dr. Kenneth Cooper. The books Lopez specifically used were: *The Aerobics Program for Total Well-Being* (Bantam Books, 1982), *The Aerobics Way* (Corgi Books, 1977), and *The New Aerobics* (Bantam Books, 1970). Lopez also stated that the USAF School of Aerospace Medicine and Surgeon General's office have data that substantiates "...the Air Force's overall poor fitness level."⁹ Clear evidence was presented to demonstrate that the Air Force, in 1986, had managed to lapse into the same poor state of fitness that it had in 1961! Further, Lopez asserts that fitness must be considered a combat effectiveness multiplier.¹⁰

He argues that the 1986 Physical fitness standards were minimal and hardly equate to meeting the fitness of the normal U.S. population! Lopez makes the point that unlike the normal population, the military will be challenged to meet "... wartime requirements of round-the-clock operations with associated sleep deprivation, noise, confusion, prolonged surge operations, etc. Based on the research, it doesn't appear that the Air Force has the finely honed war-fighting capability it believes it has."¹¹

Lopez provides ten recommendations, most of which relate to improving the combat readiness of Air Force personnel through an enhanced physical fitness program.¹² His most important recommendation was that to insure the success of the Air Force physical fitness program it had to have the total support and participation from the top echelon to the unit level. His second recommendation is that the physical fitness program must motivate personnel to achieve the minimum physical activity as outlined by the American Academy of Sports Medicine. In 1986 this 'minimal physical activity' involved three exercise periods per week of about 30 minutes in duration and that produced enough intensity to achieve 70 percent of maximum heart rate reserve.¹³ Lopez also recommended that the annual fitness test be changed from annual to semiannual; that it incorporate muscle strength/endurance; that the 1.5-mile test be realigned from the Cooper 'marginal' category to the faster 'good' category. Lopez states that at least three hours of duty per week be set aside by commanders for physical fitness training. Motivating and educating personnel is extremely important to effect an Air Force-wide positive attitudinal change towards physical fitness. Lopez also addresses the need for service-wide physical fitness evaluations and studies utilizing students at PME schools. He recommends that the Air Force should conduct a physical fitness evaluation of personnel "...during a large-scale exercise that closely approximates the surge requirements of combat conditions."¹⁴ This data could be used to "...determine current fitness levels in response to wartime contingencies, and then conduct a similar evaluation a year later to evaluate the impact of heightened physical fitness in meeting mission demands."¹⁵

Majors Torgier G. Fadum and R. Allen Reynolds: Effectiveness of the Air Force Fitness Program

The second study reviewed was written in 1988 and entitled, "Effectiveness of the Air Force Fitness Program."¹⁶ It was authored by Majors Torgier G. Fadum and R. Allen Reynolds while both were Air Command and Staff College students. This study investigated the effectiveness of the current Air Force fitness program and the effectiveness of potential program changes. The study included a formal written survey of 1365 officers and 240 senior noncommissioned officers attending Air Force PME schools at Maxwell and Gunter AFB's in November of 1987.¹⁷ Responses were obtained from 1,252 personnel which gave the survey a confidence factor of 95%. Thirty-six questions were asked and divided under the following four categories: 1) background information, 2) personal attitude, 3) the current Air Force Physical Fitness program, 4) possible changes to the Air Force Physical Fitness program. Even though the survey is over 11 years old, it captures the fitness attitudes of Air Force officer and senior NCO leadership in 1987. Fadum and McReynolds admit that the principle limitation in this survey was that the survey population was limited to PME students only.¹⁸ They recognize that their survey is not a comprehensive report, rather a pilot study. I would argue, based on personal experience and interviews I have had with numerous commanders, that the same results would probably be realized if the survey was taken today. Fadum and McReynolds clearly illustrated from their survey that there is support from all respondent groups for..."strengthening the physical fitness program by using tougher aerobic standards, more frequent testing, and (to a lesser degree) adding upper-body muscular-endurance tests. Consistent with their other opinions, commanders are particularly supportive of these changes."¹⁹

This paragraph outlines some of the survey questions that have particular interest to this authors hypothesis. They are included to provide the reader a flavor of the survey contents and results:

1) Question 23 asked how often physical fitness tests should be administered, every 3, 6, or 12 months, or 'never,' or 'no opinion.' Of those surveyed, 47.6% felt the frequency of testing should be every 3 months and 29.5% said it should be every 6 months. Only 14.4% said to leave the program at it's current annual testing cycle.²⁰

2) Questions 21 and 22 asked if future aerobic requirements for men and women should be 'easier,' 'harder' or the 'same,' as compared to 1987 standards. The response was that 51.8% of men felt that the test should remain the same and 37.8% felt it should be harder. Comparatively, 40.7% of women felt it should stay the same, while 42.9% felt the test should be harder.²¹

3) Questions 26-29 addressed adding pushups and sit-ups to the fitness test. Regarding whether to add pushups into the test, 55.4% of males and 49.6% of females surveyed favored this addition. Additionally, 60.6% of males and 58.2% of females surveyed, agreed with adding sit-ups to the test.²²

4) Question 24 asked if..."Testing every 6 months (versus 12 months) would cause serious problems at the unit level due to lost duty time and the additional workload for Unit Fitness Program personnel." Of those surveyed, 79% indicated that there would not be a serious problem. On the other hand, 11.1% thought there would be a problem.²³

5) Question 25 asked whether testing every three months would cause any problems at the unit level. The response was that 58.4% said there would not be a problem. However, 27% of those surveyed said there would be a problem.²⁴

6) Question 29 and 30 asked whether adding 'sit-ups' or 'pushups' to the fitness test would "cause serious problems at the unit level due to lost duty time and the additional for Unit Fitness Program personnel."²⁵ Of those surveyed, 72% said adding pushups would cause no problems and 72.6% said that adding sit-ups would cause no problems.²⁶

7) Question 32 asked if the mandatory reporting of fitness test results on officer and enlisted performance reports “would be a practical and effective way to motivate personnel and improve fitness.”²⁷ The results were that 30.6% agreed and 59% disagreed with including fitness results on performance reports. Over 10% were undecided.²⁸

8) Question 33 addressed encouraging the use of 2.5 hours of duty time per week for physical training as an effective action that a unit commander might use to improve unit fitness.²⁹ The response was that 82% felt this was an effective way to improve unit fitness. Over 11% thought it was an ineffective way of improving unit fitness and over 6% had no opinion.

Fadum and McReynolds make four recommendations to improve the Air Force Fitness Program. First, they want to incorporate “tougher” running standards, include pushups and sit-ups into the test protocol, and increase the frequency of testing to at least every six months.³⁰ Their second recommendation is to change Air Force policy to encourage commanders to “allow duty time for physical training unless mission requirements dictate otherwise.”³¹ Their third recommendation is that the Air Force should build a comprehensive fitness education program to teach Air Force personnel the virtues of keeping physically and mentally fit. Incorporating other alternative aerobic exercises into a personal fitness program, such as cross-country skiing, cycling, swimming and jazzercise, should be encouraged. Additionally, this education program should cover nutrition, weight control, cardiovascular disease, aerobic fitness, and muscle endurance. The Air Force for many years has ...”emphasized running as the principle means for both conditioning and testing, for a number of reasons, such as physical effectiveness of training, ease of administration, availability of facilities, etc.”³² Fadum and McReynolds final recommendation is that the Air Force should incorporate alternative forms of aerobic testing to allow commanders more flexible options if the appropriate facilities and resources are available.³³

Lt Colonel Brian P. Quarrie: Air Force Weight and Fitness

Programs

The third study reviewed was “Air Force Weight and Fitness Programs” by Brian P. Quarrie, Lt Colonel, USAF, a student at Air War College, Maxwell AFB, Alabama, in 1989.³⁴ This study reviewed the Department of Defense (DoD) Directive 1308.1 on U.S. military physical fitness and weight control programs. Quarrie demonstrates that the Air Force has shifted its emphasis from physical fitness programs to fitness evaluation only. In 1989, the Air Force had combined physical fitness and weight control programs into one regulation. Quarrie argues, (with much documented research), that...”the ‘compliance oriented’ weight control program is producing satisfactory results while the physical fitness (evaluation) program is not insuring physically qualified personnel.”³⁵ Quarrie argues that the complex Air Force weight control program needs to be divorced from the alleged fragmented physical fitness program.³⁶ Only then can each program be managed effectively. Quarrie makes two key recommendations regarding the Air Force Physical Fitness Program. First, the Air Force must actively involve senior leadership in defining the role of fitness. Secondly, the Air Force must reexamine its current running aerobics program and perhaps evolve to a more credible fitness program using the Instructional System Development (ISD) process.

Quarrie points out that in the process of implementing the aerobics fitness program, the Air Force has...”lost the importance of ‘training the way you fight’ and the importance of testing to validate both the training effect and the fighting capability.”³⁷ Quarrie reviews two physical fitness studies completed in 1983 on Air Force Firefighters and Civil Engineering Prime BEEF Rapid Runway Repair teams.³⁸ For example, young firefighters entering the career field for training were below average in fitness and above average in body fat. With age, the fitness levels of these firefighters deteriorates to the level where they are not able to perform strenuous

mission tasks. Yet these same firefighters were able to pass Air Force physical fitness evaluations. These studies illustrated vividly that..."individuals, responsible for their own physical fitness programs and successfully passing the annual physical fitness evaluation, could deteriorate physically; thus documenting that its physical fitness program was not contributing to the needs of its personnel or mission."³⁹ Further, Quarrie asserts that more studies pertaining to physically demanding job tasks are needed in order for the Air Force to develop reliable fitness standards and evaluations.

Quarrie notes that the Army, Navy, and Marine Corps physical fitness programs are tailored to the their respective missions and the Air Force should consider their adoption where feasible.⁴⁰ A key observation Quarrie makes is that the other services conduct training prior to their physical fitness tests, they test more than once per year, and they incorporate muscle endurance and cardiorespiratory training and testing into their respective programs.⁴¹

Quarrie's primary recommendation focuses on adapting the Instructional Development Systems (ISD) process to the Air Force Physical Fitness program.⁴² He outlines an ISD model for fitness and recognizes the amount of work and manipulation required to develop a team approach to the problem. The ISD process involves five steps: 1) analyze system requirements--Air Force fitness objectives and standards must be clearly defined; 2) define training requirements--determine what the baseline fitness level of the force is; 3) develop objectives and test--these objectives are determined from the previous two steps and should focus on expected fitness performance; 4) plan, develop, and validate instruction--focus on fitness training that ensures passing the test; and 5) conduct and evaluate training--training manuals need to detail how instruction is to be conducted. Quarrie concludes that feedback throughout the entire process will ensure a continuous flow of information. Finally, he states that the goal of the ISD..."is to develop the most cost-effective, viable training program through a logical, systematic process and the Air Force could easily adapt physical fitness to this process."⁴³

Lt Colonel Robert A. Barlow: The Air Force Physical Fitness

Program: An Application of the Gingrich 'Vision vs. Tactics'

Test

The fourth study reviewed was written in 1990 by Robert A. Barlow, Lt Colonel, USAF, while a student at the Air War College. His study entitled: "The Air Force Physical Fitness Program: An Application of the Gingrich 'Vision vs. Tactics' Test," evaluates the vision that senior Air Force leaders have regarding the Air Force Fitness Program.⁴⁴ Barlow discusses changes in the Air Force Physical Fitness program, which include reviews of the previous three studies. In 1990, Air Force commanders now had the latitude to design their own unit fitness programs. However, Barlow states that many unit fitness programs "...consist of nothing more than the annual fitness evaluation."⁴⁵ He asserts that senior Air Force leaders must hold unit commanders accountable for the fitness level of their personnel.

In the final section of his study, Barlow concludes that "...there is strong evidence that too many Air Force military members are not sufficiently physically fit to safely accomplish their Air Force missions when faced with the additional stresses of natural disaster, contingencies or war."⁴⁶ He continually emphasizes that all Air Force leaders may want a physically fit force, but few are taking the necessary steps to ensure their personnel achieve optimal fitness for combat readiness. Further, Barlow takes exception with the previous three studies whereby they failed to recognize the opportunities and flexibility inherent in the current (1990) Air Force Fitness Program.⁴⁷ He argues that the current fitness program has the flexibility for innovation and enhancement "...which would ensure the fitness foundation necessary for survival in high-stress environments, such as war."⁴⁸ Further, Barlow does not agree with the three previous studies that the low level of fitness in the Air Force is caused by lack of attention by senior leadership. He does agree that fitness levels of Air Force personnel are low.⁴⁹

Barlow's recommendations are two-fold: Air Force senior leaders need to hold unit commanders accountable for the fitness of their personnel and the current fitness program offers enough flexibility for a unit commander to optimize combat readiness. He continually emphasizes that Air Force commanders must not "...accept the present Air Force fitness evaluation standard as their fitness program..."⁵⁰ He cites a report submitted by Representative Dan Daniel of Virginia in the aftermath of the Beirut bombing incident.

"...when an officer accepts command of troops, he accepts not only the responsibility of accomplishing the mission, but the guardianship of those who serve under his command. The military hierarchy exists and can function because enlisted personnel entrust their well being and their lives to those with command authority. When those in command either abdicate that authority or neglect that guardianship, more is lost than lives. Lost also is the trust that enables those who follow those who lead."⁵¹

To reiterate Barlow's key point: senior Air Force leaders must hold unit commanders fully responsible for the fitness of assigned personnel. He asserts that the current (1990) Air Force fitness regulation (AFR 35-11) gives the unit commander enough latitude in implementing fitness standards. It could be inferred that Barlow thinks there are too many unit commanders in the Air Force, who for reasons unknown, do not consider the fitness of their personnel a top priority. Barlow concludes his recommendations with a scathing remark that reinforces his hypothesis. "In the case of the Beirut bombing, plenty of Congressional blame was levied upon the entire chain of command above the unit commander on scene, but that unit commander was officially identified as primarily responsible for the inadequate preparations which allowed the deaths of those under his command."⁵²

Lt Colonel Frank J. Destadio: Peacetime Physical Fitness and its Effect on Combat Readiness an Air Force Perspective

The fifth study reviewed was written by Frank J. Destadio, Lt Colonel, USAF while a student at the Army War College. The study was completed in 1991 and is entitled "Peacetime

Physical Fitness and its Effect on Combat Readiness an Air Force Perspective.”⁵³ Destadio begins his study with the assertion that physical fitness programs are essential in order for military personnel to withstand the rigors of combat. He continues by stating that, generally speaking, no one would debate against the need for physical fitness. Rather, the issues being debated are “...what standards of measurement should be used to determine the prescribed level of fitness, and are our peacetime physical fitness programs adequately preparing our soldiers for combat?”⁵⁴ Destadio defines fitness, evaluates guidance, and analyzes current fitness improvement efforts to determine their validity. He concludes his study by providing recommendations from a Commanders perspective.

Destadio examined similar studies that Barlow, Quarrie and Lopez had reviewed. One such study, (Myhre, 1989), was to assess the fitness levels of Air Force firefighters at four Air Force bases. The results of these tests revealed that the average firefighter was above average in body fat composition. Additionally, these same firefighters were below average in Vo2 max. (Note: The Army Physical Fitness Institute defines Vo2 as the volume of oxygen being used by the body during exercise. As an *absolute* measure of aerobic fitness, Vo2 is expressed in liters of oxygen consumed per minute or L/min. As a *relative* measure of aerobic fitness, Vo2 is expressed as milliliters of oxygen consumed per minute, per kilogram of body weight or ml/kg min-1. An individual’s Vo2 max is measured by collecting expired gases while they vigorously exercise to failure). The intent of this study was to also provide a baseline fitness value for the firefighter. A training program was set up using the cycle ergometer (Monark 868) along with muscular strength exercises. The results of this 12-month test showed a remarkable improvement in Vo2 max and a significant decrease in body fat composition.⁵⁵ The Vo2 max changed 16.7%,

from 37.7% at the beginning of the test, to 43.9% at the end. Additionally, bodyfat percentages at the start of the test were 21.5% and at the end of the test they decreased to 15.5%.

In another study conducted by Myhre in 1987, the metabolic costs of Air Force Civil Engineering rapid runway repair activities were assessed. Rapid runway repair (RRR) involves teams of engineers lifting and placing together portable metal runway matting, (AM2 matting). This task is extremely strenuous and is often accomplished while wearing the complete chemical warfare ensemble. Relative to the subjects body weights, laying AM2 matting required an average of 22ml/kg/min (Vo2 max).⁵⁶ Delgadio summarizes the usefulness of this Vo2 max data by comparing the data to the average U.S. sedentary male. For example, if the average sedentary male Vo2 max is 45 ml/kg/min, and it is divided by the Vo2 max required for laying AM2 matting (22 ml/kg/min), the result is the working capacity needed to perform the task. In this case the individual would be working at 48.88% of their maximum capacity. It is obvious that a person could perform this task for relatively long periods of time. Delgadio makes a comparison of this AM2 matting study with the earlier firefighter study. The average firefighter studied had a Vo2 max of 33.8 ml/kg/min. Dividing 33.8c ml/kg/min by the Vo2 max needed (22 ml/kg/min) for laying AM2 matting, the result is the individual is working at 65.08% of their maximum capacity. Delgadio states that "...this individual will not be able to maintain the pace needed to repair damaged runways during combat."⁵⁷

In his conclusion, Delgadio states that physical fitness programs in the Air Force must focus on the "units wartime mission."⁵⁸ Physical fitness must be balance with the unit's unique combat activities. Delgadio continues the ideal Air Force fitness program must be safe, effective, practical, and medically sound. He suggests incorporating the Monark 868 Cycle Ergometer as one suitable aerobic conditioning platform. Further, Delgadio argues that incorporating the cycle

ergometry exercise platform with a mandatory fitness program such as “Combat PT” would be the logical foundation for a unit’s fitness program. The “Combat PT” is a program developed at Shaw AFB and it incorporates “...specific exercises and activities that are aimed at improving specific muscle groups required for the units wartime mission.”⁵⁹

Delgadio makes a strong assertion that standards for aerobic capacity need to be increased and those standards must be a condition for retention in the Air Force. He chides that active duty Air Force must have “...at least, the Vo2 max of the average sedentary American.”⁶⁰ (His review of the Air Force fitness program clearly shows that the aerobic standards adopted for males and females in 1991 are at the average ‘sedentary’ level for Americans).

Delgadio concludes his study with three recommendations. First, that Air Force fitness programs must improve and maintain cardiovascular endurance and muscle strength. Using the newly enhanced Air Force firefighter test protocols would optimize this endurance and strength. Secondly, higher levels of fitness that reflect the unit’s wartime mission must be obtained within a one year period and then maintained. This ‘higher level of fitness’ program should mirror the current ‘Combat PT’ program used at Shaw AFB, VA. Additionally, this conditioning must be mandatory and take place three times per week. Finally, Delgadio states that a new comprehensive pamphlet must be prepared and distributed throughout the Air Force to educate and facilitate quick implementation of the program.⁶¹ Delgadio closes with a quote from General “Tony” McPeak, USAF Chief of Staff:

I feel that being a warrior is a special job. It has special benefits, privileges and rewards. But it also makes some very special demands on people who decide to take up the profession of arms. I do not understand how warriors who are not physically fit can be ready for combat. So I try to maintain a certain standard of physical fitness. I urge everyone to do the same. We are not civilians in uniform. We are warriors. We need to act, feel, and be WARRIORS.⁶²

FITNESS IN THE RESERVE COMPONENTS

Are the Reserve Components complying with DoD directives? In March 1994, the U.S. Government Accounting Office released a report to the Chairman, Subcommittee on Readiness, Committee on Armed Services for the House of Representatives. This report entitled: "Reserve Forces, DoD Policies Do Not Ensure That Personnel Meet Medical and Physical Fitness Standards," determined that the DoD had not corrected previous problems that occurred prior to operations Desert Shield and Desert Storm.⁶³ Some reservists were not in physical condition for combat and others had difficulty in performing their functions while deployed. While this GAO report identified problems of all Service branches, primary focus will be on the Air Force reserve components. Additionally, this report uncovered serious medical problems that are prevalent within the reserve components of the Army and the Navy. However, none of the medical findings will be discussed. Ironically, no Air Force Reserve units were included in the GAO case studies because the Air Force Reserve had elected to discontinue mandatory physical fitness testing in June of 1992.⁶⁴ However, it could be inferred that problems identified in the GAO report could also be realized by the Air Force reserve components.

The objective of the report was threefold. First, to determine the adequacy of physical fitness tests as a measure of reservists' preparedness for military missions. Second, were management controls adequate to ensure that fitness program objectives were met? Finally, were the medical retention policies and procedures adequate for the reserve components? (This latter objective, although interesting, will not be discussed). The GAO was very thorough in its examination of Service fitness policies and practices. Methodology included: identifying the fitness test components for each Service; reviewing DoD and Service fitness and training

guidance; analysis of Navy and Army studies on fitness levels during Operations Desert Shield and Desert Storm; and finally, observations were obtained from key DoD, JCS and Service officials regarding relationships between fitness testing and mission performance. This study was conducted between April, 1992 and August, 1993.

This GAO study argued that in general, fitness testing among the Services lacked a mission focus or continuity. Consequently, their results illustrated that “none of the services has developed physical fitness tests that evaluate the specific physical skills individuals may need to perform their military mission.”⁶⁵ Specifically, the Air National Guard data reviewed showed that virtually all reservists tested between 1990 and 1992, passed. Air Force officials attributed the high passing rate of almost 98% to its “non-demanding test.”⁶⁶ In contrast, the Marines attributed their 97% passing rate to their pro-fitness philosophy. When comparing how well the reserve component services fared during the Gulf war mobilization, the GAO report cited two Army reports. In 1992, the Sixth Army Inspector General (IG) concluded that poor fitness contributed to the heart attack deaths of eight reservists. Further, it was shown that some reservists’ poor physical condition kept them from performing their wartime taskings. To support these findings, the Sixth Army mobilization station administered the Army physical fitness test in 1991 to 17,500 soldiers. The failure rate at each of the mobilization stations ranged from 35-55 percent! The Sixth Army IG attributed this trend of poor physical fitness to the reserve components’ unit physical fitness programs. These unit programs focus primarily on how to perform successfully on the annual physical fitness test, rather than developing or optimizing the physical skills a soldier needs to carry out their war time taskings. The Fort Jackson, South Carolina mobilization group provided the second Army report, in September 1992. It noted that most reserve component soldiers did not maintain their personnel fitness at the level required for

sustained wartime operations. In 1990, over 3,552 reservists processed through the Fort Jackson mobilization station. Of these 75 percent failed their the physical fitness test on arrival!⁶⁷ In contrast, the U.S. Navy currently discharges approximately 2000 active duty personnel annually for failure of their semi-annual Physical Readiness Test.⁶⁸

A recent United States General Accounting Office study dated November 1998, recommended a contrasting position from the aforementioned 1994 GAO report. The report, entitled: "Gender Issues, Improved Guidance and Oversight Are Needed to Ensure Validity and Equity of Fitness Standards," was submitted to the Subcommittee on Readiness, Senate Committee on Armed Forces.⁶⁹ The objectives of this report were to: assess the service component rationale for differences in fitness standards; investigate how the Services adjust their fitness standards for differences based on gender and age; and finally what oversight responsibilities the DoD has for the U.S. Armed Forces physical fitness programs. The DoD agreed with all the recommendations of this GAO report. The main GAO recommendation was to establish that the objective of the DoD physical fitness program is *to enhance general fitness and health of the armed forces.* (Interestingly, this recommendation is contrary to the 1994 GAO report that recommended that more focus needed to be placed on service personnel *being fit to perform mission and sustained war-time taskings*). The DoD agrees that it's physical fitness program (1998) is not intended to address an individual's capability to perform their specific jobs or war-time missions. Other recommendations were: to establish a system for coordinating military fitness and weight management policy; establish clear science based DoD policy for gender and age adjustments to fitness and body fat standards; define statistical information needed to monitor fitness trends and require this information to be maintained by each service and submitted annually to the DoD. The DoD was also asked to take steps to ensure that all

military personnel are tested in three areas: cardiovascular endurance, muscular strength and endurance, and body composition. Finally, all U.S. military members must be tested for fitness, regardless of age.

AIR FORCE RESERVE FITNESS PROGRAM

Air Force reserve components continually struggle with how to establish a fitness program that can be maintained by the airman year-round. If one agrees with the argument that a mandatory fitness program is necessary to insure individual compliance with Air Force fitness standards, which includes passing the annual fitness test, then how are airmen motivated to carry out such a program? Meaningful physical fitness cannot be achieved during the two days per month drill period. Air Force Reserve Command Instruction 40-501 (14 November 1997), Air Force Reserve Fitness Program, states that the purpose of the program is to "assess the fitness level of AFRC unit members to ensure they are physically prepared to support all military operations, exercises, or other contingencies."⁷⁰ Further, the instruction states that all members of the Air Force Reserve must be fit and that each member *should have a year round conditioning program* that emphasizes cardio-respiratory endurance. Further, it is mandated that each reservist meet and maintain AFRC fitness standards by participating in "...regular aerobic exercise throughout their military service and into retirement since they remain subject to recall for national emergencies."⁷¹ Effective 11 July 1997, annual fitness tests will be either a timed 3-mile walk or, when available, by using cycle ergometry procedures. Due to personnel availability and time constraints, the Air Force Reserve has almost exclusively used the 3-mile walk as the measure of cardiovascular fitness and muscle endurance. The Air Force uses the 1990 American College of Sports Medicine fitness guidelines for its fitness program enhancement. These

guidelines are the minimum activities necessary to meet Air Force standards. These guidelines are quoted directly from AFI40-501 and outlined below:

Mode of activity: Any activity that uses large muscle groups for a prolonged period and is aerobic and rhythmic in nature. Examples are: running, swimming, bicycling, skating, rowing, cross-country skiing, structured aerobic class, etc.

Intensity of exercise: Physical activity corresponding to a heart rate in the target heart rate zone that is 60%-90% of member's age-specific maximum heart rate estimate (220-age).

Duration of Exercise: 20-60 minutes of continuous exercise in the target heart rate zone.

Frequency of exercise: minimum of three days per week.

Rate of progression: the conditioning effect will either allow an increase in total work done or reduce the heart rate response to a given workload over time. This effect is the most pronounced during the first 6-8 weeks, especially in the unfit. Adjustments in mode, intensity, duration, and/or frequency may be necessary to reach higher levels of performance.⁷²

The active Air Force has Fitness Program Managers (FPM) that are trained exercise physiology professionals who hold graduate degrees in exercise related fields. Additionally, FPM's are required to be certified by the American College of Sports Medicine as a Health Fitness Instructor. Some reserve installations do not have a resident FPM on staff. Instead of a FPM, Air Force Reserve regulations provide an Installation Fitness Program Director (IFPD). A IFPD is appointed to this additional duty by the installation commander. Often the IFPD has no professional qualifications that would support and enhance the effectiveness of the position. The IFPD provides guidance to Unit Fitness Monitors (UFM). The UFM's are additional duty administrative positions designed to assist the unit commander in carrying out their unit fitness program.

Whenever failures of the Air Force fitness test occur (reserve or active), members are placed into the Self-Paced Fitness Improvement Program (SFIP). The Air Force Reserve SFIP is a comprehensive rehabilitative 90-day program that monitors the member's progress. The SFIP allows participants, depending on their age group, to perform exercises that include but are not

limited to: running, jogging, walking, cycling, stationary cycling, swimming, aerobic dancing, racquetball or squash. While under the SFIP, participants must exercise at their prescribed target heart rate at least three to five times per week. During these days of exercise, aerobic activities must be performed for a minimum of 20 to 30 minutes. Individuals can be allowed to remain in the SFIP for one year. Members are not allowed to participate in formal technical training while in the SFIP. Failure to meet fitness standards after 12 months could result in administrative action by the unit commander.

One could characterize the AFRC fitness program as a punitive one. If standards are not met—you are entered into a *rehabilitative* program. The AFRC mandates year-round participation in a fitness program yet this is perhaps the most difficult requirement for a reservist to comply with. Fitness compliance is further exacerbated by the various classifications of reservists. For example, the focus of this discussion has been limited to the active reserve component. What is the fitness level of the Individual Ready Reserve (IRR)? These individuals are not required to drill and are only required to annually update their personal data. A study of Army IRR members that were mobilized during Operation Desert Storm. Out of 2,723 arriving IRR soldiers, 677 were rejected for a variety of reasons. Of the 677 that were rejected, 196 failed to meet weight standards.⁷³ The IRR is a critically important component of the overall Total Force. The Air Force has about 66,000 IRR's assigned, a few of which were activated during Operation Desert Shield and Desert Storm. Based on the Army IRR study, an inference could be drawn that a portion of Air Force IRR component members may not meet the required minimum Air Force weight or fitness standards.

MOTIVATION EXPLORED

How to keep a reservist *motivated* to maintain their own personal fitness program is the primary challenge. It is obvious that a meaningful fitness program cannot be established for only one drill weekend per month. Changing the reservist's attitude toward fitness is a difficult undertaking. Positive and/or negative approaches could be used. Different approaches will generally result in some people accepting changes. However, at the foundation of developing a personal fitness program is *commitment*. Numerous studies have been made regarding the psychological aspects of adhering to fitness/exercise programs. Exercise psychology research focuses on exercise's effect on: mood, anxiety, depression, disease, immune system, and adherence. Jim Annesi, Ph.D., and director of Enhanced Performance Technologies, observed that for many people, exercise experiences are connected with feelings of discomfort, frustration and displeasure.⁷⁴ These feelings could be compounded when one enters a fitness center for the first time. Common feelings center on being out of place--everyone in the center appears to know what to do and how to do it, but the first-timer doesn't. Other negative aspects of exercise programs that participants must overcome are: lack of motivation, time constraints, frustration with slow progress, and discomfort performing the exercise regimen.⁷⁵ Professor Rozalind Gruben, American Health Institute, argues that in order to be emotionally fit, one needs a diversity of skills that are similar to those required for physical fitness.⁷⁶ Gruben states that strength, flexibility, endurance, body awareness, reaction time and balance are required for emotional fitness. Psychological strength refers to having a clear purpose and goal towards one's fitness program. Self-discipline is a resultant factor of strength. Flexibility of the mind is the ability to willingly adapt to changing situations. Psychological endurance refers to the ability to

cope with challenges handed to us. Body awareness is the ability to recognize signals that your body sends regarding physiological needs such as sleep or nutritional deprivation. Reaction time refers to the skill of quickly discerning factual information. Gruben asserts that the ‘information overload’ that bombards today’s society could keep a person from focusing on what is truly important in one’s life. Balance is the ability and skill of embracing and optimizing all of the aspects of total fitness. Gruben argues that only through a solid understanding of emotional health can total fitness be improved.⁷⁷ Boone and Weise studied the effects of psychophysiologic self-regulation on running economy.⁷⁸ Psychophysiologic self-regulation is the ability to learn conscious control of the autonomic nervous system to bring involuntary responses. Involuntary responses refer to respiration rates, oxygen uptake, heart rate and blood pressure. They elicited a relaxation response during exercise and found that submaximal Vo2 was not decreased. Further, elicited relaxation response during exercise did not alter the running economy of the subjects. Additionally, statistically significant changes in ventilation and blood pressure “...has a positive and unequivocal beneficial influence on the work of the heart during exercise.”⁷⁹ Chad Tackett, President of Global Health and Fitness, outlined key points for staying motivated in a training program.⁸⁰ Tackett discusses seven areas that can enhance motivation. The first two are set goals that are measurable and attainable. In keeping with his ‘making exercise fun’ theme, Tackett recommends changing certain exercise factors such as: varying the exercise and repetitions; using alternate exercises; and changing the order of exercises. His fourth recommendation is to include friends and family in your workout. A workout partner that shares the same goals and interests will keep a person motivated. Additionally, workout partners can make training sessions more fun, safe, and intense. Tackett’s fifth point is to fight discouragement. He states one should never feel guilty for taking a day off from training.

Further, one should focus on the amount of progress one has attained to date, rather than focusing on how far you have to go. His sixth recommendation is to expect and prepare for plateaus. He argues that people will get bored when reaching a plateau. This boredom needs to be set aside and a person should focus instead on making exercise routines fun and exciting. Thackett's final recommendation is that workouts need to be scheduled. Exercise routines then become a part of a person's daily schedule. Vicki Pierson and Renee Cloe report that drop out rates for those who begin an exercise program reach at least 50 percent by the end of the first six months.⁸¹ Pierson and Cloe, both certified personal trainers, argue that three main factors affect a person's motivation to stay with an exercise program --personal factors, program factors and environmental factors. Personal factors focus on what an individual's perception is towards exercise. Does the person feel there is value in the exercise? Is it convenient and enjoyable? Is the person able to perform exercises? Program factors pertain to the exercise program itself. Is the program schedule complimentary with an individual's daily schedule? Is the program varied enough to diminish boredom? Is it fun? Environmental factors deal with things that you can or cannot control. Is the individual setting up regular cues to remind themselves to exercise? An example given is packing a gym bag and leaving it by the door or scheduling exercise on a monthly calendar. Does the individual have an ongoing support system in place? This would include a workout partner or including family members in exercise activities. In conclusion, Pierson and Cloe state that the motivational process is dynamic and ongoing and will require different strategies at the various stages of one's exercise program.⁸² John P. Porcari, Ph.D., Jason M. Zedaker, M.S., and Monica M. Maldari, M.S. studied virtual reality machines as a method to elicit increased exercise motivation.⁸³ This study examined the use of virtual reality (VR) machines as an alternative exercise medium. These VR machines "...provide a

combination of auditory and visual stimuli designed to get the user 'caught up' in participating, thus diverting the users' attention focus from an internal one to an external one. By tuning in to external cues and surroundings, rather than to internal bodily cues (such as breathing), the user may delay the onset of boredom and fatigue.⁸⁴ Two VR machines were used in this study, a Tectrix VR stepper, and a Tectrix recumbent cycle. Both machines incorporate interactive CD ROM games that create a virtual environment similar to playing an exercise video game. The user of the Tectrix VR stepper 'flies' a World War 2 biplane equipped with water cannons and attempts to shoot down hot air balloons and destroy sites to earn points. The faster the stepper moves the faster the plane goes allowing the 'flier' to maximize game points. The VR recumbent cycle provides a number of different scenarios. Two scenarios are, cycling through the Swiss Alps, complete with ski jump, and a cycle race against computer generated competitors. The VR recumbent cycle has a built in fan that increasingly blows harder on the operator the faster it is peddled. The seat also tilts and tips as the operator 'rounds corners' and the handlebars have a gear shifting mechanism built into them. The results showed that heart rates were 5-10 beats per minute higher and oxygen consumption values were 10-14 percent higher on the VR machines compared to non-VR machines. Caloric expenditures were 40-70 kcals higher on the VR machines versus the non-VR machines. Interestingly, subjects worked at the same perceived effort on both machines but were actually working at a higher exercise intensity on the VR machines.⁸⁵ Psychologists describe this work effort phenomenon as dissociation.

Other studies that examined external stimuli on running outdoors as compared to running on an inside track. One such study, (Ceci and Hassmen, 1991), reported that when comparing running velocity, heart rates and lactic acid values, the physiological responses were higher when running outdoors.⁸⁶ Subjects tested, (Harte and Eifert, 1995), felt less anxious, less depressed,

less angry and hostile and more invigorated following an outdoor run. Additionally, hormonal markers of stress, norepinephrine and cortisol, were significantly lower following the outdoor run. Porcari, Zedaker and Maldari concluded that "...VR or interactive exercise equipment may provide the type of feedback and enjoyment necessary to help some people not only stay with an exercise program, but to reap greater benefits once they get started."⁸⁷

In 1997 the DoD launched a motivational program of sorts called "Operation Be Fit." This initiative, headed up by Gail McGinn, DoD Director, Personnel Support, Families and Education, was developed to improve the level of fitness activities throughout the DoD community. Herman Marshall interviewed McGinn in Interservice magazine, the business journal of The American Logistics Association. McGinn stated that the DoD wants to maximize the benefits of a fit lifestyle that the US Surgeon General advocates. Benefits such as "...decreases in cardiovascular disease and some kinds of cancer, improved psychological well-being, and overall lower mortality rates. 'The bottom line,' says McGinn, 'is an improvement in productivity, greater quality of life, and lower personnel and health costs. That means an increase in readiness.' "⁸⁸ There are four aspects to "Operation Be Fit" initiative. First, the Military Family Institute at Marywood College was contracted to survey DoD fitness facilities and programs. Secondly, the DoD will develop new standards for facilities, equipment and programs. Third, standards will be developed for fitness center staff throughout the DoD. Lastly, the DoD will create an incentive and awards program that is designed to encourage military personnel, dependents and installations to increase their level of physical activity. McGinn stated that this initiative "...is a very high priority for the Department of Defense," she adds, "not only in terms of military personnel being fit, which is of course our number one priority, but because physical fitness reduces stress levels and contributes to better health overall. This is one area where the

DoD should really have a leadership role. We know how to do it: now we just need to make sure we can get everything in place for people to make it happen.”⁸⁹

Another aspect of motivation that has been thoroughly studied is the affect that learned adaptive skills have on adherence to exercise. Annesi reviewed over 127 exercise promotion adherence studies. He concluded that the two most superior techniques were one’s that either *modified the exercise setting or altered an individual’s perceptions about the challenges of maintaining routine exercise.*⁹⁰ Specific partialized goal setting is one example of altering perceptions. Annesi states that when “...individuals set long-term goals, and are shown how to divide them into short-term goals that focus on manageable but challenging quests, adherence goes up.”⁹¹ Further, an adequate feedback system is very helpful to complement and strengthen commitment to a goal and to reinforce regular exercise. Performance feedback has been shown to be strongly associated with increased exercise adherence.⁹² Experiencing incremental exercise gains and acknowledging the completion of the exercise session, will strengthen and reinforce exercise adherence. Further, Annesi states that studies show that 90% of individuals prefer to exercise in groups.⁹³ Whenever exercise participants felt that they were part of a group, adherence increased significantly. Finally, Annesi outlines the concept of self-motivation, and has found that individuals who are truly self-motivated, will adhere to an exercise program. Interestingly, Annesi formally evaluates clients on their self-motivation using a brief, validated psychological test. In effect, Annesi is able to categorize clients based on their vulnerabilities. This allows him to optimize and customize individual services for the client.⁹⁴

RECOMMENDATIONS

1. Incorporate the newly revised American College of Sports Medicine exercise protocols:

The physical fitness of Air Force reserve components must continue to focus on a year-round conditioning program. Anything less would seriously degrade the fitness level of the force. In order to facilitate the professional administering of the program, unit fitness representatives must be trained not only in physical fitness, but also in basic dietetics/nutrition and motivation. The current active Air Force course for installation fitness managers must be made available for anyone administering a military fitness program. An option would be to develop a two-week course for reservists.

The current Cooper Institute aerobic exercise recommendations as outlined in AFI 40-501 should be adhered to with one small exception. Recent American College of Sports Medicine (ACSM) findings demonstrate that the duration of aerobic exercise can also be optimized by 10-minute bouts of exercise accumulated throughout the day.⁹⁵ These intermittent 10-minute bouts must total at least 20-60 minutes of total exercise per day, which supports current Air Force Reserve fitness protocols. In effect, intermittent aerobic exercise will give the participant flexibility and allow much easier adherence than one finds with a high-intensity exercise activity. The ACSM categorizes this type of total fitness exercise program, as a "moderate intensity" program that is conducive for adults who are not training for athletic competition.⁹⁶ Additionally, since the Air Force will be building into its fitness program strength, endurance and flexibility standards, I recommend following the current ACSM guidelines as quoted from the 1998 ACSM pronouncement:

1. Resistance training: Resistance training should be an integral part of an adult fitness program and of a sufficient intensity to enhance strength, muscular endurance, and maintain fat-free mass (FFM). Resistance training should be progressive in nature, individualized, and provide a stimulus to all the major muscle groups. One set of 8-10 exercises that conditions the major muscle groups 2-3 d.wk -1 is recommended. Multiple set regimens may provide greater benefits if time allows. Most persons should complete 8-12 repetitions of each exercise; however, for older and more frail persons

(approximately 50-60 yr. of age and above), 10-15 repetitions may be more appropriate.

2. Flexibility training: Flexibility exercises should be incorporated into the overall fitness program sufficient to develop and maintain range of motion (ROM). These exercises should stretch the major muscle groups and be performed a minimum of 2-3 d.wk⁻¹. Stretching should include appropriate static and/or dynamic techniques.⁹⁷

The ACSM also made some recommendations regarding mode of activity. Activities that utilize large muscle groups and which can be maintained continuously, is rhythmical and aerobic should be incorporated into a whole-body fitness program. Some examples provided by the ACSM that are not mentioned, but could be included in the Air Force fitness program are: stair climbing, walking-hiking, cycling and various endurance game activities or combinations thereof.⁹⁸ The current AFI gives commanders the flexibility to customize their respective programs.

2. Establish a system of “fitness levels” to correspond to Air Force Specialty Codes:

Earlier Air Force studies previously mentioned that had categorized AFSC job codes with a fitness aerobic level, should be resurrected and be considered for implementation. In doing so, minimum and maximum fitness levels will be established and will allow personnel a range of fitness to strive for based on their job specialty. There is something to be said for presenting the opportunity for personnel to strive to achieve maximum scores on the annual fitness test. For example, many in the active duty Army view the annual fitness test as a competition and challenge and will strive to maximize their scores. The current AFI allows a commander to test unit personnel more often than annually. However, I would strongly argue against having fitness tests more than annually. There is very limited time to accomplish this annual testing on drill weekends. I personally tried not to interfere with the daily squadron activities and consequently scheduled testing close to the end of the duty day.

3. Annual Air Force Reserve fitness tests must incorporate muscle strength and endurance, aerobics and flexibility:

Annual fitness tests must incorporate the requirements of the 1995 DoD directive, which should include muscle strength and endurance, aerobics, and flexibility. Evidently the Air Force is undergoing testing to determine what additional exercises will be incorporated into the fitness test. Quite frankly, a three-mile walk under current completion time protocols does not give a commander a good assessment of the overall fitness of unit personnel.

4. The Air Force Reserve must create a long-term comprehensive fitness/wellness education program:

Reinforcing the requirements outlined in the current Air Force Reserve fitness regulation, mandates compliance for a 'year-round' fitness program. To comply with this directive, a major paradigm shift needs to occur regarding fitness training within the reserve component. Fitness attitudes and motivation can only succeed under a well-executed long-term plan. Fitness, health, nutrition, diet, conditioning and motivation must be taught using sound science. Various studies clearly show that multifaceted behavioral programs that include dieting, behavior modification and exercise, have produced positive results.⁹⁹ A standardized comprehensive fitness/wellness course must first be taught in basic training and then reinforced through recurring training throughout an airman's career. Hopefully basic trainees receiving a solid education in the above-mentioned disciplines, will apply what they have learned henceforth. Airmen should not be simply taught how to pass a fitness test as is the case in some of the services. Rather, Quarrie's ISD process (or some similar one), should be used to create an Air Force Reserve fitness training program that is cost-effective and viable.

5. Positive and negative incentives to motivate personnel should be closely examined:

Interviewing various individuals from the Army War College's Health and Fitness advanced course has yielded one common recommendation—promotion eligibility should be dependent on an individual's ability to meet the minimum fitness test scores. The Air Force does not include fitness scores on their performance reports. However, the Army and Marines include their fitness scores on their performance reports. If the active Air Force or Air Force Reserve is serious about the importance of fitness, then I can think of no better way for Air Force leadership to demonstrate this than by having performance reports reflect fitness test scores. Torgier and Fadum addressed this in their questionnaire and found approximately 30% of those questioned agreed that performance reports would be an effective and practical way to motivate personnel to improve fitness. Almost 60% of those interviewed disagreed which could infer the political non-reality effecting such a change in Air Force doctrine. It is very evident from speaking with many former battalion commanders, that the Army system of placing fitness scores on performance reports works exceptionally well to motivate soldiers. The Air Force should examine this motivational recommendation carefully.

Additionally, consideration could be given for negative motivation. For example, failure to pass fitness tests the second time could result in prevention of promotion, reenlistment, transfer or eligibility for the bonus program. Although the current regulation gives the commander authority to impose administrative action, mandating certain administrative actions puts more teeth into current policy.

Other motivational incentives that could be used are fitness awards and other incentives. An Air Force Reserve fitness awards program could be developed that resemble some of the Army's incentive programs. One such Army program is the Adjutant General Physical Fitness Excellence Gold/Silver/Blue Award. Awards are given to soldiers who earn 90% or higher on

their fitness test. Perhaps, instead of airmen meeting minimum fitness standards, scores could be established to provide a competitive incentive. Airmen who improve their fitness scores significantly and/or who score in the top percentile could receive some type of an Air Force Reserve fitness award or incentive.

6. Air Force Reserve Unit Fitness Program Managers should receive similar or enhanced training:

Certain Air Force Reserve units do not have access to professionally certified fitness trainers. Additionally, unit Fitness Program Managers (FPM) are assigned this responsibility as an additional duty. The Air Force Reserve should mandate that all unit FPM's be certified fitness trainers and attend the active duty FPM course at USAF/SAM within six months after being appointed. Another option would be for the Air Force Reserve to develop a similar FPM course. The advantage of a "reserve FPM" course is that more emphasis can be placed on behavior modification, attitude, motivation, and building an exercise program that is conducive to the reservist's lifestyle.

7. More research is needed regarding the influences of reservist's health behaviors and civilian workplace environment on readiness:

More research is needed in the areas of health behaviors, civilian workplace relationships and conditions, and their influences on the Reserve Component readiness. Very little information exists regarding what factors exist that relate to the health and fitness of reservists as compared to the active force and civilian counterparts. I strongly favor Wynd's argument that interventions need to be developed for reservists that attempt, "...to make exercise, as well as adequate nutrition and appropriate rest/sleep periods, etc., part of a reservist's daily schedule. Future research should be undertaken to measure health risks and mechanisms for enhancing health-

promoting behaviors.”¹⁰⁰ I would recommend the same research questions that Wynd proposed. However, these questions should apply to all Reserve Component members, not just Army reservists. These research questions are modified as follows:¹⁰¹

1. How do health-promoting behaviors differ among reservists and their civilian and active duty counterparts?
2. How do health risk behaviors differ among reservists and their civilian and active counterparts?
3. What influence do reserve component physical fitness and weight control standards have on motivation for health-promoting behaviors?
4. To what extent do reservists engage in regular training regimens versus pre-Physical Fitness Test only training regimens?
5. To what extent do reservists maintain normal weight pattern versus engage in pre-weight-in loss regimens?
6. How do the following serve as contributors or barriers to health-promoting behaviors in reservists? (Demographics; Internal motivation; Interpersonal factors; Situational factors; and Workplace factors).

7. Annual fitness assessments of the Individual Ready Reserve should be conducted:

Another recommendation is to require Individual Ready Reservists (IRR) to undergo an annual weigh-in and physical fitness test to ascertain their fitness level. Studies indicated that a significant amount of Army IRR's did not meet the Army's fitness test criteria when mobilized during Operation Desert Shield and Desert Storm. This trend could be present across all service component IRR's. IRR's are called in annually for updating their emergency data cards and other

administrative tasks. Since they are paid to attend this annual meeting, it would seem logical to administer the fitness and weight tests at the same time.

8. Encourage the use of “combat physical fitness” programs throughout the Air Force:

Throughout the Air Force there are in existence “combat PT” type programs. Two examples of where one can find these programs being used are in Air Force Special Operations Command and Air Combat Command. Combat PT is an enhanced fitness program that requires participants to routinely workout on exercises over and above the official aerobic fitness testing that the Air Force espouses. These customized programs incorporate certain muscle strength and endurance exercises, in addition to aerobics and flexibility training. These programs could focus on exercises that are designed to complement the type of work activity an airman would perform. For example, Air Force firefighters have a customized fitness program that seeks to optimize muscle endurance, flexibility and aerobic capacity. Air Force leadership should take a stronger stand to encourage these types of programs throughout the Air Force.

CLOSING THOUGHTS

Downsizing of the US military without reducing the operations tempo has forced our fighting men and women to accept increased responsibilities. Increased operations tempo brings to the table, additional stresses and challenges to all military personnel, regardless of rank. Our troops must be absolute masters at their respective job specialties. In addition, the fitness level of our military personnel relates directly to their sustainability in combat. We can ill afford to enter the next millennium with an armed force that lacks the mental toughness and physical fitness to carry out any mission assigned. The Reserve Components of the US Armed Forces are now expected to be key players in the Total Force structure of the Department of Defense. For

example, Air Force Reserve and Air National Guard units will be incorporated into, and play a vital role in, the new Aerospace Expeditionary Force. Yet, are the Reserve Components up to the increased operations tempo? Specifically, during operations Desert Shield and Desert Storm clear evidence demonstrates that a portion of Reserve Component forces are not physically fit to undergo the rigors of combat. Further, testing of certain Air Force specialties showed that they had the physical fitness of less than the average sedentary male in the US!

In the foreseeable future, the United States will continue in its role as the world's superpower. The United States' aggressive national security strategy of engagement and enlargement will codify the increase in reserve deployments worldwide. Short-notice deployments to participate in military operations other than war and small-scale wars will probably be the norm for reservists. Juggling a reserve military career and a civilian career is a demanding and challenging lifestyle. The Reserve Components must be prepared mentally, emotionally and physically, at all times, for military activation. Anything short of this is unacceptable. ---WORD COUNT = 11,510.

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